NOVEMBER/DECEMBER 2023

23PCS11 — ANALYSIS AND DESIGN OF ALGORITHMS

Time : Three hours Maximum : 75 marks

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SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

1. Define queue.

2. What is a heap?

3. Mention the two ways to traverse a graph.

4. State the strategy of divide-and-conquer.

5. When a solution is said to be optimal?

6. Define Knapsack problem.

7. Define travelling salesperson problem.

8. What is flow shop scheduling?

9. List the two types of constraints.

10. Define the problem sum of subsets.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Write a short note on the time complexity of an algorithm.

Or

(b) What are the various representations of a graph? Explain.

12. (a) With an example, explain binary search.

Or

(b) Discuss Quick Sort.

13. (a) Explain Kruskal's algorithm.

Or

(b) Describe Dijkstra's algorithm.

14. (a) Define All-pairs shortest-paths problem. Write the algorithm for all-pairs shortest path problem.

Or

(b) Write a short note on optimal binary search.

15. (a) Write the procedure for Hamiltonian cycles.

Or

(b) Write a short note on branch and bound.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Define stack. Explain the push and pop operation on a stack with an example.

17. What are the three ways of traversing a binary tree? Explain with an example.

18. Define minimum cost spanning tree. Describe Prim's algorithm to construct a minimum cost spanning tree. Give an example.

19. Explain multistage graph problem with a neat example.

20. Discuss 8-queens problem.

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